

COVID-19 Rapid Evidence Profile #1 (14 April 2020)

Question

What is known about approaches to and safety of conserving, reusing, and repurposing different kinds of masks?

What we found

We identified four highly relevant full systematic reviews and two highly relevant rapid reviews, but no guidelines that were developed using a robust process.

Conserving masks

One highly relevant, high-quality full systematic review and one highly relevant rapid review addressed conserving masks:

- [Decontaminating N95 masks with ultraviolet germicidal irradiation \(UVGI\) does not impair mask efficacy and safety](#)
- [Optimization of N95 respirator masks during supply shortages](#)

Reusing masks

Two highly relevant, high-quality full systematic reviews (the first of which also addresses conserving masks) and one highly relevant rapid review addressed reusing masks.

- [Decontaminating N95 masks with ultraviolet germicidal irradiation \(UVGI\) does not impair mask efficacy and safety](#)
- [Microwave- and heat-based decontamination of N95 filtering facepiece respirators \(FFRs\)](#)
- [Safety of extended use and reuse of N95 respirators for COVID-19](#)

Repurposing masks

One highly relevant, medium-quality full systematic review addressed re-purposing masks.

- [Medical masks versus N95 respirators for preventing COVID-19 in healthcare workers](#)

Box 1: Our approach

We identified evidence addressing the question by searching the guide to COVID-19 evidence sources on 14 April 2020 (www.mcmasterforum.org/find-evidence/guide-to-covid-19-evidence-sources).

We searched for guidelines that were developed using a robust process (e.g., GRADE), full systematic reviews (or review-derived products such as overviews of systematic reviews), rapid reviews, protocols for systematic reviews, and titles/questions for systematic reviews or rapid reviews that have been identified as either being conducted or prioritized to be conducted. Single studies were only included if no relevant systematic reviews were identified.

We appraised the methodological quality of full systematic reviews and rapid reviews using AMSTAR. Note that quality appraisal scores for rapid reviews are often lower because of the methodological shortcuts that need to be taken to accommodate compressed timeframes. AMSTAR rates overall quality on a scale of 0 to 11, where 11/11 represents a review of the highest quality. It is important to note that the AMSTAR tool was developed to assess reviews focused on clinical interventions, so not all criteria apply to systematic reviews pertaining to delivery, financial, or governance arrangements within health systems.

This rapid evidence response was prepared in three hours or less to inform next steps in evidence synthesis, guideline development and/or decision-making related to the question that was posed.

We provide in Table 1 (below) an overview of the type and number of documents that were identified. We provide in Table 2 a listing of each of the documents (organized by document type and sorted by relevance to the question and COVID-19), with colour gradient used to reflect high (darkest blue) to low (lightest blue) relevance to the question and to COVID-19.

Table 1: Overview of type and number of documents that were identified

Type of document	Conserving masks	Reusing masks	Repurposing masks
Guidelines developed using a robust process (e.g., GRADE)	0	0	0
Full systematic reviews	3	4	1
Rapid reviews	2	2	2
Guidelines developed using some type of evidence synthesis and/or expert opinion	2	3	0
Protocols for reviews that are underway	1	3	0
Titles/questions for reviews that are being planned	1	3	5
Single studies in areas where no reviews were identified	1	0	0

Table 2: Documents that address the question, organized by document type and sorted by relevance to the question and COVID-19

Type of document	Relevance to question	Focus	Recency or status
Guidelines developed using a robust process (e.g., GRADE)		No guidelines were found that used a robust development process	
Full systematic reviews	• Reusing masks	Microwave- and heat-based decontamination of N95 filtering facepiece respirators (FFR) (AMSTAR rating 8/10)	Literature searched on 30 March 2020
	• Reusing masks	Decontaminating N95 masks with ultraviolet germicidal irradiation (UVGI) does not impair mask efficacy and safety (AMSTAR rating 8/10)	Literature searched on 22 March 2020
	• Repurposing masks	Medical masks versus N95 respirators for preventing COVID-19 in healthcare workers (AMSTAR rating 7/10)	Literature searched on 9 March 2020
	• Conserving masks	Physical interventions to interrupt or reduce the spread of respiratory viruses - Part: Face masks, eye protection and	Last updated on 1 April 2020

Type of document	Relevance to question	Focus	Recency or status
		person distancing: systematic review and meta-analysis (AMSTAR rating 9/10)	
	<ul style="list-style-type: none"> Conserving masks 	Protecting healthcare workers from pandemic influenza: N95 or surgical masks? (AMSTAR rating 6/10)	Published in 2010
	<ul style="list-style-type: none"> Conserving masks 	Effectiveness of N95 respirators versus surgical masks against influenza (AMSTAR rating 9/10)	Literature searched on 27 January 2020
	<ul style="list-style-type: none"> Reusing masks 	Face masks for the prevention of infection in healthcare and community settings (AMSTAR rating 5/9)	Published in 2014
Rapid reviews	<ul style="list-style-type: none"> Conserving masks 	Optimization of N95 Respirator masks during supply shortages	Last updated on 14 April 2020
	<ul style="list-style-type: none"> Conserving masks Reusing masks 	Safety of extended use and reuse of N95 respirators	Literature searched on 23 March 2020
	<ul style="list-style-type: none"> Reusing masks 	Microwave- and heat-based decontamination for face mask personal protective equipment (PPE)	Last updated on 29 March 2020
	<ul style="list-style-type: none"> Repurposing masks 	What is the efficacy of standard face masks compared to respirator masks in preventing COVID-type respiratory illnesses in primary-care staff?	Last updated on 30 March 2020
	<ul style="list-style-type: none"> Reusing masks 	N95 reprocessing (Trillium Health Partners, Institute for Better Health; personal communication)	Draft on 6 April 2020
	<ul style="list-style-type: none"> Reusing masks 	The safe use and reuse of personal protection equipment (Ontario Ministry of Health's Research, Analysis and Evaluation Branch; personal communication)	Last updated on 27 March 2020
	<ul style="list-style-type: none"> Repurposing masks 	Face masks and similar barriers to prevent respiratory illness such as COVID-19	Prepared on 31 January 2020 (pre-print; not yet peer-reviewed)
Guidance developed using some type of evidence synthesis and/or expert opinion	<ul style="list-style-type: none"> Conserving masks Reusing masks 	Addressing PPE shortages during a pandemic	Last updated on 24 March 2020
	<ul style="list-style-type: none"> Reusing masks 	Recommended guidance for extended use and limited reuse of N95 filtering facepiece respirators in healthcare settings	Last updated in 2020

Type of document	Relevance to question	Focus	Recency or status
	• Reusing masks	COVID-19 – What we know so far about... reuse of personal protective equipment	Last updated 4 April in 2020
	• Reusing masks	COVID N95 UV-C decon & reuse	Last updated 1 April in 2020
	• Reusing masks	COVID N95 UV-C decon & reuse - heat & humidity	Last updated 2 April in 2020
	• Reusing masks	COVID N95 decon & reuse – hydrogen peroxide vapor & hydrogen peroxide vapor gas plasma	Last updated 2 April in 2020
	• Conserving masks	Rational use of personal protective equipment (PPE) for coronavirus disease (COVID-19)	Last updated 19 March 2020
	• Reusing masks	Reusability of face masks during an influenza pandemic	Last updated 2006
Protocols for reviews that are underway	• Reusing masks	Efficacy of different methods of disinfection and sterilization to reuse masks and respirators	Ongoing (anticipated completion by 30 April 2020)
	• Re-using masks	Ultraviolet germicidal irradiation (UVGI) for face mask personal protective equipment (PPE)	Ongoing (anticipated completion by 23 April 2020)
	• Re-using masks	Decontamination intervention for the reuse of surgical-mask personal protective equipment (PPE)	Ongoing
	• Conserving masks	The effect of masks and respirators to prevent respiratory infections in healthcare and household settings	Ongoing (anticipated completion by 29 April 2020)
Titles/questions for reviews that are being planned	• Conserving masks	What are the challenges associated with reuse and extended use of PPE equipment in the context of COVID-19?	Question under review
	• Reusing masks		
	• Reusing masks	Are reused or extensively used N95 masks effective and safe compared to single use of N95 masks in healthcare settings?	Awaiting prioritization to conduct
	• Reusing masks	Efficacy and safety of disinfectants for the decontamination of N95 and SN95 filtering facepiece respirator (FFRs)	Ongoing
	• Reusing masks	Decontamination interventions for the reuse of surgical-mask personal protective equipment (PPE)	Ongoing

Type of document	Relevance to question	Focus	Recency or status
	• Repurposing masks	N95 masks versus surgical masks for preventing transmission of COVID between positive inpatients and providers caring for them	Awaiting prioritization to conduct
	• Repurposing masks	What forms of non-standard PPE are there (e.g., homemade masks) and what is the evidence of their efficacy?	Question under review
	• Repurposing masks	What is the evidence for the efficacy and safety of masks repurposed from other industries in protecting healthcare staff from COVID-19 infection?	Question under review
	• Repurposing masks	What is the efficacy of 'armour-lite' personal protective equipment (PPE) as offered to U.K. primary-care staff in the context of COVID-19?	Question under review
	• Repurposing masks	Cloth masks for community compared to medical grade masks or nothing to prevent spread of respiratory viruses	Ongoing
Single studies in areas where no reviews were identified	• Conserving masks	Utility of substandard face-mask options for healthcare workers during the COVID-19 pandemic	Published on 31 March 2020

Wilson MG, Gauvin FP, Waddell K, Moat, KA, Lavis JN. COVID-19 rapid evidence profile #1: What is known about approaches to and safety of conserving, reusing, and repurposing different kinds of masks? Hamilton: McMaster Health Forum, 14 April 2020.

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